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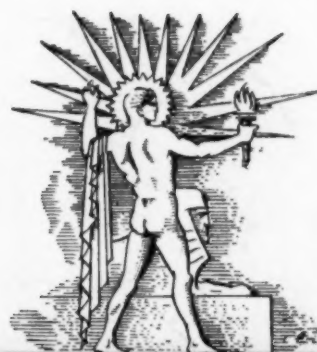
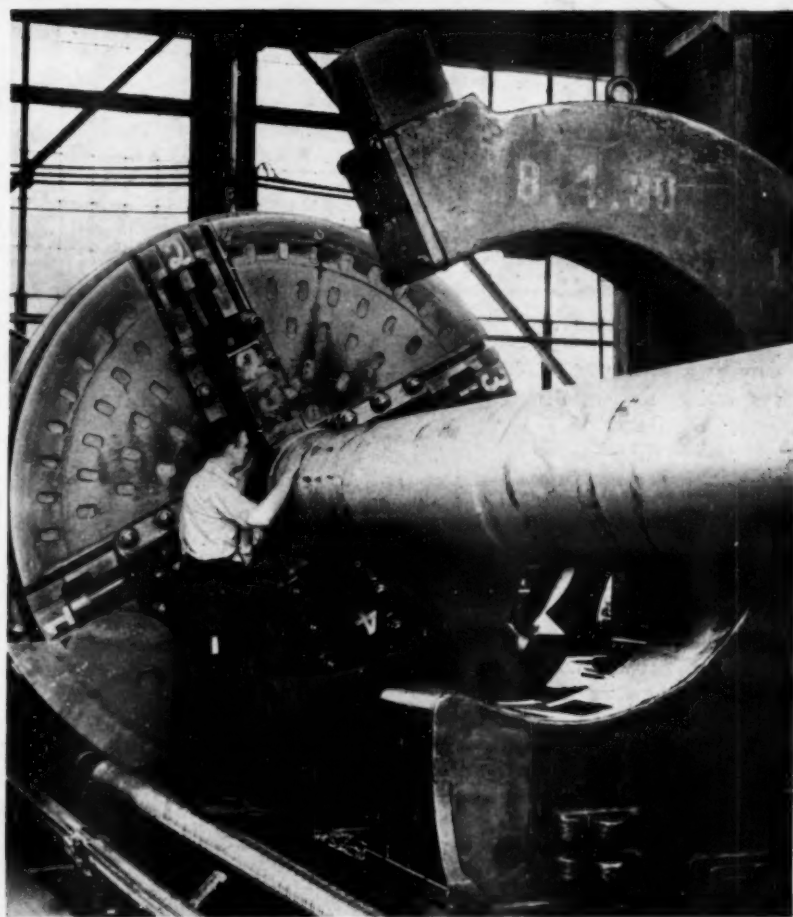
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SCIENCE NEWS LETTER

THE WEEKLY SUMMARY OF CURRENT SCIENCE •



February 25, 1939

Dedicated to Mars

See Page 115

A SCIENCE SERVICE PUBLICATION

Do You Know?

A survey of bird songs was made in the British Isles last year by about 80 observers.

A life-size model of a blue whale 93 feet long has just been completed for the British Museum.

Some of the Yellowstone Park bears are hibernating in steam-heated dens, warmed by hot springs.

Plastics can be made from coffee, thus suggesting a use for some of South America's surplus coffee bean crop.

Deaths from heart disease are unnecessarily high, and could be reduced by vigorous public education, says a Brooklyn physician.

The earth's present climate is cooler than "normal," according to a Canadian geologist, surveying conditions in the past millions of years.

Starlings are great insect-eaters, but this good trait is offset by their molesting native song birds and their noise and filth when roosting in cities.

Eleven tree-climbing kangaroos are among the animal specimens obtained in Dutch New Guinea by the Archbold-American Museum expedition.

Although goldfish have been fed quantities of tuberculosis bacteria in experiments, these fish have never been known to develop tuberculosis.

QUESTIONS DISCUSSED IN THIS ISSUE

Most articles which appear in SCIENCE NEWS LETTER are based on communications to Science Service, or on papers before meetings. Where published sources are used they are referred to in the article.

AERONAUTICS

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What is the only fiber actually synthesized by man? p. 121.

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What new usefulness has the microphone achieved in industry? p. 120.

ENGINEERING—MUSIC

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MEDICINE

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ORDNANCE

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PHYSICS

Can paper remain in good condition for more than a hundred years? p. 125.

PUBLIC HEALTH

Why is smallpox still causing deaths in the United States? p. 120.

RADIO

What new development makes the radio useful as a telephone? p. 120.

STATISTICS

How could a revision of the death certificate aid in the compilation of complete birth statistics? p. 123.

A hedge of lavender orchids, with as many as a thousand in bloom on some days, can be seen at a botanic station in Baiboa, Canal Zone.

Testing jaw strength, a Columbia University dental professor found that Eskimos have far more biting strength than college football men.

The spotted hyena is not so ferocious after all, says a German zoologist, who has made friends with some of these animals in Leipzig zoo.

Japanese beetles eat nearly 300 species of plants, but they draw the line at cone-bearing evergreens, rarely troubling them.

A schoolhouse built recently near Brighton, Florida, is the first school ever built for Seminole Indians at their own request.

A two-deck Phoenician ship pictured on the wall of a palace in Ninevah conveys an idea of the sort of ship King Solomon built for sea trade.

SCIENCE NEWS LETTER

Vol. 36 FEBRUARY 25, 1939 No. 8

The Weekly Summary of Current Science, published every Saturday by SCIENCE SERVICE, Inc., 2101 Constitution Avenue, Washington, D. C. Edited by WATSON DAVIS.

Subscriptions—\$5.00 a year; two years \$7.00; 15 cents a copy. Ten or more copies to same address, 5 cents a copy. Back numbers more than six months old, 25 cents.

Members of the American Association for the Advancement of Science have privilege of subscribing to SCIENCE NEWS LETTER at the reduced price of \$3 per year. Applications for this privilege should be accompanied by privilege card obtained from the Permanent Secretary, A.A.S.S., Smithsonian Institution Building, Washington, D. C.

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Cable address: Scienservc, Washington.

Entered as second class matter at the post-office at Washington, D. C., under the Act of March 3, 1879. Established in mimeographed form March 18, 1922. Title registered as trademark, U. S. and Canadian Patent Offices. Indexed in Readers' Guide to Periodical Literature and in the Engineering Index.

Advertising rates on application. Member Audit Bureau of Circulation.

SCIENCE SERVICE is the Institution for the Popularization of Science organized 1921 as a non-profit corporation, with trustees nominated by the National Academy of Sciences, the National Research Council, the American Association for the Advancement of Science, the E. W. Scripps Estate and the journalistic profession.

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ORDNANCE

U. S. Naval Gun Factory Is Rushing Production Again

Washington Arsenal, Only Plant of Its Kind in U. S.,
Guards Its Complicated Process for 16-Inch Pieces

See Front Cover

WASHINGTON, D. C., is not an industrial city. It was planned that way from the beginning. Yet there is in Washington a factory that manufactures heavy steel goods. It is a big factory, employing 7,700 men. It makes only one line of merchandise, and it has only one customer.

Guns for the Fleet! That tells in a phrase the business of the Naval Gun Factory, busier now than it has been for a good many years. The lapse of the naval limitations agreement, and the resumption of battleship construction, has brought the first wholesale orders for 16-inch guns that the factory has had for a couple of decades.

The new battleships for the U. S. Navy are on the stocks now. They won't be ready for launching for many months yet, but as soon as they are, the giant guns will be waiting to be set in their turrets. If you could visit the Naval Gun Factory today, you would see dozens of those long, ponderous thunderbolt-hurlers of modern war, in all stages of preparation, stacked like poles in a telegraph company's timber yard.

They aren't the only pieces of ordnance in the factory. All sizes and calibers are there, smaller guns, piled up like cordwood. There are 3-inch and 5-inch anti-aircraft guns, 6-inch and 8-inch guns for the cruisers, and a scattering of 14-inch pieces from existing battleships, being reconditioned for further service. But the 16-inch guns are the real pets of the factory just now.

Wonderful Birth

The birth of a 16-inch naval gun is wonderful to watch—a marvel of modern metallurgy.

Heavy guns of the present day are not solid masses of steel. The fearful stress of the powder-gas pressure necessary to hurl the two-ton projectiles twenty miles or more would exact a penalty of disaster for a hidden flaw. So the gun is assembled out of several hollow cylinders or tubes fitting over

each other. It is easier to make these thinner sections without dangerous flaws, easier also to detect such flaws, if they exist, and so eliminate faulty parts.

The innermost tube, the one through which the shell travels when the gun is fired, is called simply that: the tube. The other hollow cylinders of steel that are fitted over it to give it added strength are all known as hoops.

The Naval Gun Factory gets tubes and hoops as semi-finished forgings from the great steel companies. These steel masses are set in the gun lathes (and they are lathes; each one as long as a city building lot!), and turned off smooth, and accurate to the thousandth of an inch. The finished surface would serve for a mirror.

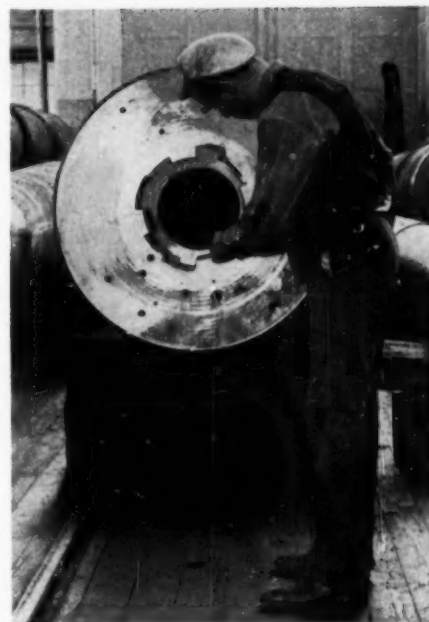
Inside as well as out, the hoops are bored out accurately, and mirror-smooth. They are made just a little smaller than the outside diameter of the tube over which they are to be set.

That looks just a wee bit difficult—worse than trying to get a size 12 foot into a size 10 shoe. How will they do it?

Hugs the Tube

Not so hard, after all. They just take advantage of the well-known fact that metal expands when heated. They heat the hoop in a tall, cylindrical electric furnace. They stand the tube on end, cold, in a pit a hundred feet deep. They lift the heated hoop out of the furnace and lower it over the cold tube. Then they let it cool—and shrink. The hoop hugs the tube literally in a grip of steel, adding the tremendous tension of the shrinking force to the natural strength of the metal.

The second hoop is heated, and shrunk over the first. The rest of the hoops are added in the same way, until the gun stands completed. Then it is lifted out of the pit, by an enormous traveling crane. It is put back into the gun lathe and the finishing tool gnaws away at its outer surface until it has the symmetrical profile of a finished gun.



ON THE LATHE

The Naval Gun Factory's lathes are tremendous machines, with beds as long as a city building lot. This one grips the tube of a battleship's heavy gun, on which machining is about to begin.

Heavy threads are cut into the thick metal of its breech, to receive the breech mechanism.

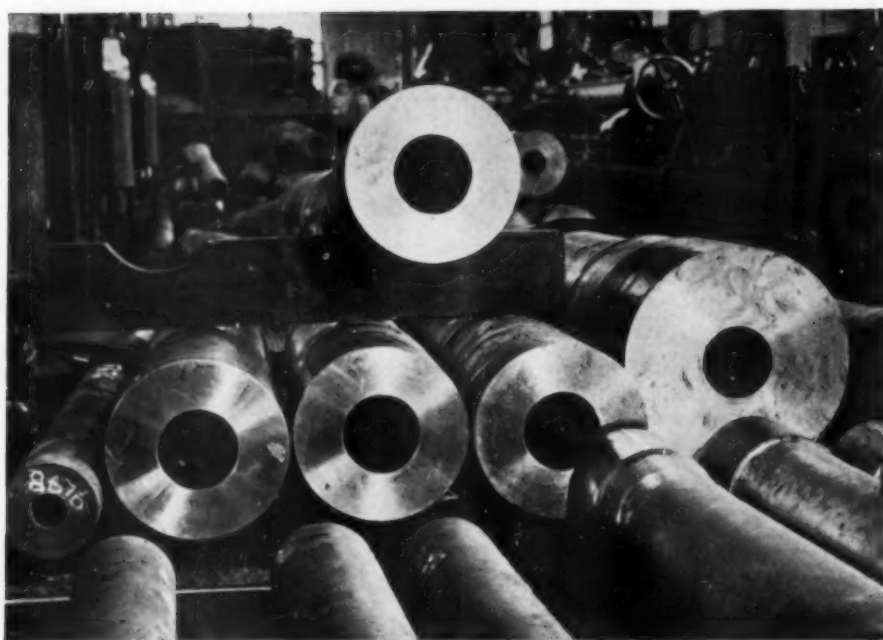
Now it is ready for the last and most critical of the operations, the rifling. To make the projectile travel on a true path, it must be given a spin. This is imparted by means of twisted grooves that run from breech to muzzle, with the exception of the chamber, or the part into which powder and shell are loaded.

A long, heavy rod, bearing at its end a cutting tool armed with diamond-hard teeth, is thrust slowly down the throat of the new gun. Just the right amount of turn is given to cut the grooves into the proper spiral path. Gauges go over the finished work, inchwise, seeking jealously for the least inaccuracy.

Approval

At last the inspector-officers nod approval. They can find no fault. The new gun is ready to join the Navy after successfully withstanding test firing at the Naval Proving Ground.

This elaborate job of building up a gun out of central tube and enclosing hoops used to be necessary for smaller caliber pieces as well as for the heavy ordnance of a battleship. However, within recent years advances in forging processes, and especially a method for



PILED UP LIKE CORDWOOD

These are small-caliber guns, in all stages of manufacture. Eventually they will become parts of anti-aircraft and anti-torpedo armament, or peer from the gun-houses of light cruisers.

building up tremendous internal pressures within the bore while at the same time the outer part of the forging was being shrunk, has made it possible to make guns up to 6-inch caliber out of a single piece of metal. This method,

known as the "monobloc" system, has greatly increased the speed with which small-, and medium-caliber guns can be built, and at the same time has considerably reduced costs.

Science News Letter, February 25, 1939

AERONAUTICS

Transatlantic Air Service Planned To Start This Spring

Pan-American Expects To Run Two Roundtrips a Week, New York to London and Also New York to Marseilles

PAN-AMERICAN Airways expects to provide transatlantic air service four times a week at a total yearly cost of almost \$4,000,000 to the government in the form of postal subsidy, the airline's application to the Civil Aeronautics Authority for permission to fly between the United States and Europe reveals.

Two flights in each direction each week will leave from New York or an alternate American port for Southampton or London, depending upon whether the Boeing Clipper or the Boeing Stratoliner is used. Two roundtrips a week are also to be made between New York

and Marseilles, according to a schedule of operations expected to be in effect by the end of the first year of operation. Passenger service will start this spring.

Both flying boats and a landplane—the Boeing Stratoliner, 33-passenger ship now undergoing tests in Seattle—are to be used in maintaining service on such a frequent basis.

Revenue from an expected 2,338 passengers a year and from cargo will total about one and three-quarter million dollars, while operating costs plus return on investment will come to about \$5,-

683,000, a financial statement attached to the application discloses. The difference, Panair officials are known to hope, will be made up by payments for carrying transatlantic mail.

Panair officials anticipate making only one survey flight preliminary to scheduled mail and cargo trips, several of which are to be made before passengers are carried. Six roundtrip surveys in 1937, plus the company's experience in more than a year of operation between New York and Bermuda and two years of flight across the Pacific eliminate the need for any further study.

Application

Information contained in the application constitutes actually the first such detailed announcement of the line's intentions. The schedules promise 19-hour service between New York and London in the Boeing Stratoliner, a 200-mile-an-hour four-engined landplane whose sealed cabin will not only allow stratosphere flight, but will keep the plane afloat in the event of a forced landing at sea.

New York-London service by the northern route in the Boeing Clipper will take twenty-four and a half hours. The return trip will take slightly longer because of prevailing winds. It will be flown over the northern route, via Newfoundland and Ireland, only during the summer months.

The southern route, via the Azores and Lisbon to Marseilles in the summer, and to London as well in the winter, will take 43 hours. On this route, an overnight stop will be made at Lisbon. This is believed due to the fact that European facilities for night flight are not up to American standards.

Departures for London will be made every Wednesday and Saturday, Tuesday and Saturday departures from England for the United States. Clippers will leave an American port for Marseilles each Tuesday and Friday and will return Monday and Friday, according to the tentative schedule.

Besides the Boeing Stratoliner, four Boeing Clippers will be used. Of these, two have already been delivered, with the others scheduled to come along at the rate of one a month between now and May.

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Hamburg, Germany, plans to construct the world's tallest skyscraper.

Both Chaucer and Omar Khayyam were astronomer-poets.

AERONAUTICS

New Device Synchronizes Multi-Engine Plane Motors

Small Electric Motor of Differential Type Alters Settings of Propeller Blades Whenever Speeds Vary

AN AUTOMATIC device to drive the motors of a multi-engine airplane at exactly the same speed and thereby eliminate bumpy "beats" from flying was announced by the Hamilton Standard Propeller Division of the United Aircraft Corporation in East Hartford, Conn.

It is known as the automatic propeller synchronizer and continuously keeps engines even more finely adjusted than the most skillful human pilot. Slight differences in engine speed—on the order of 20 revolutions a minute or so—produce "beats" every few seconds which can be and often are annoying to passengers. At the same time the synchronizer relieves the already too busy crew of another job, manual adjustment of engine speed for this same purpose.

Heart of the engine synchronizer is a small electric motor of the differential type. The motor has two electrical wire windings, one fed with current from a small alternating current generator driven by one engine and the other with current from a generator powered by another engine. The frequency of the alternating current in each case depends on the speed of the motor driving the generator.

Balance Each Other

If the two engines are operating at the same speed, the current fed into each winding will be of the same frequency and the differential motor will not operate. On the other hand, if the two engines are operating at unequal speeds, the current derived from the faster engine will be of greater frequency and will turn the differential motor over. The differential motor in turn will alter the setting of the propeller blades to bring the speeds of the two motors into line.

The synchronizer may be turned off so that the pilots can have manual control of the speed if they want it, the United Aircraft Corporation explained. As the device synchronizes the motors, the speed of the differential motor is reduced, for its speed depends on how

far apart the two engines are. This enables the synchronizer to operate more surely; it doesn't have to "hunt" for the exact synchronization point.

Propellers in use in the United States on high performance airplanes such as transport ships are already of the constant speed type, but even they do not have exact enough control to eliminate the need for a synchronizer. The device was flight-tested on a twin-engined 10-passenger commercial liner converted into a flying laboratory.

Science News Letter, February 25, 1939

MEDICINE

Helium, Sun-Gas, Rescues Sandhogs Ill With "Bends"

HELIUM, the next to the lightest element in the universe, although deprived of the job of holding giant airships aloft (because the U. S. A. has none), is about to find a new job underground.

This sun-element is ready to help rescue men made ill by the high air pressures necessary when working in caissons and in subaqueous tunnels.

The Navy has shown through ten years of research that use of an atmosphere of helium and oxygen instead of the natural one of nitrogen and oxygen allows divers to work at pressures equivalent to 500 feet. Previously with ordinary compressed air the diving record was 306 feet made during salvage operations of a sunken submarine.

The advantage of helium over nitrogen is that less of it is dissolved in the diver's blood and tissues. He is less likely to get the "bends," as compressed air illness is called.

This same technique could be used on under-pressure construction by filling caisson or tunnel with helium. But this would cost prohibitively.

What Dr. Yandell Henderson, Yale physiologist and authority on such helium utilization, recommends to the American Society of Mechanical Engineers is that a helium-oxygen mixture be

used in the so-called "medical lock," a chamber used for putting the worker under pressure again if he becomes ill while being decompressed, that is, while slowly coming out of the high pressure.

If the "sandhogs" after gruelling toil to make a new traffic tunnel or sink a new bridge pier can be protected in this way by helium, this element with its romantic history will have another interesting practical use.

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POPULATION

New England Faces Problem Of a Declining Population

A SOLEMN warning has been issued to New England by Conrad Taeuber, population expert of the Federal Bureau of Agricultural Economics.

The Land of the Pilgrim Fathers faces new and very serious problems because the rate of her population growth is declining.

Business in New England as in all the United States has always been organized to meet the demands of a rapidly growing population. Expansion has been the rule. Booms have been taken for granted.

How will business adjust itself to the fact that the future will bring declining numbers of buyers? Fewer marriages will mean fewer homes to build and outfit. Baby foods, play suits, and school books will meet a slow market.

Along with the slowing down of population growth, New England is going to be bothered by the fact that migration to the city has slowed down tremendously. The city does not attract the farm boy, because industry has moved away. Mr. Taeuber has found that the number of active spindles in Rhode Island and Massachusetts dwindled about 60 per cent. in the 10 years from 1925 to 1935.

Here are problems never faced in America before. Yet New England may well be a proving ground for the rest of the nation, for the difficulties being threshed out there today are likely to face the entire country not so many years hence.

Here is a challenge to science, particularly the sciences of man. Here is an excellent opportunity for psychologists, anthropologists, sociologists, psychiatrists, public health officials, economists, political scientists, employment experts, agriculturists, and even chemists and physicists to mobilize for a united battle on what is likely to be America's greatest internal enemy.

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MYSTERY SOLVED

New Mayan findings indicate this little statuette is oldest known dated Mayan object. It bears the date May 16, 98 B. C.

TECHNOLOGY

Gold-Plated Reflectors Aid in Drying Auto Bodies

GOLD, which has found its way into objects ranging from money to false teeth, has been pressed into service to dry the enamel on your new automobile in one-tenth the time required by older methods.

Special heating lamps, equipped with gold-plated reflectors costing between five and seven dollars apiece, have been developed by the General Electric Company's Nela Park laboratories to line the walls of drying ovens in auto manufacturing plants.

So efficient are the new reflectors—about 98 per cent. for the warm infrared rays—that even after operation for several minutes, the outside of the reflectors is still cold to the touch.

The new lamps, each of which consumes electricity at the rate of 250 watts, have been in service for several months in the River Rouge plant of the Ford Motor Company, for which they were developed. Steam baths hitherto used take about ten times as long to dry the car body. Special electric controls turn the new heating lamps on and off in a traveling wave as the painted body passes through the drying tunnel.

Possible medical uses of the lamps are now being considered.

Science News Letter, February 25, 1939

ARCHAEOLOGY

Mayan Diggings Shed Light On America's First Calendar

Monument Unearthed in Mexico is Dated in Short Style Previously Thought To Be Comparatively Recent Method

A MONUMENT unearthed in tropical Mexico is, from first reports, evidence that brilliant Mayan Indians actually invented a short-cut system of writing dates in the New World before the birth of Christ. The monument, dated in the concise manner, is apparently strong confirmation that the small Tuxtla statuette of jade, dated in the short-cut system and treasured in the U. S. National Museum, is what archaeologists have hoped it was—the oldest known object dated by the Mayas.

The Tuxtla statuette, a figure of a priest in penguin regalia, bears the date May 16, 98 B. C., according to reading by Dr. H. J. Spinden of the Brooklyn Museum, and authority on the Mayan calendar. But some archaeologists have doubted that Mayas living in the century before Christ wrote the date on the image. They believed the style of short-cut date writing was a later Mayan invention, and therefore probably some Maya of comparatively late centuries inscribed the statuette, much as we might set correct dates on a statue of Ben Franklin.

The dated monument, solving the Tuxtla statuette mystery, has come to light not far from Tuxtla, at Tres Zapotes, in the state of Vera Cruz, southern Mexico. A joint expedition of the Smithsonian Institution and the National Geographic Society is exploring this site, which proves to be the most far western settlement of Mayan Indians ever found. It lies fully 100 miles west of the known Mayan zone of civilization.

Not Translated

The monument dated in the fashion of the Tuxtla statuette has not yet been fully translated into terms of our calendar. But Matthew W. Stirling, Smithsonian archaeologist and director of the field work, has concluded that it was erected early, not late, in Mayan times, thereby removing reason to doubt the great antiquity of the Tuxtla statuette. Mr. Stirling has called a consultation of Mexican and American archaeologists at the site, in view of importance of the

monument. Many archaeologists have heretofore been inclined to consider Mayan inscriptions old if dates were written in long style, and not so old if written in short style.

One archaeologist explains the Mayan date systems this way: Early Mayas wrote out cycle, day, and month as we might write "March the first, Anno Domini nineteen hundred thirty nine." Later Mayas recognized a date by position of signs, as we easily read "3-1-1939." An early monument dated in short style upsets this idea of early and late ways of ancient American dating.

Settle Old Problems

With this stone's inscription deciphered, American scholars may settle old theories as to how, and when, Mayan Indians moved over tropical America in their destiny of building the New World's greatest native civilization. Imagine archaeologists of the future arguing over the United States, and unable to decide whether the country was occupied all at one time, or whether New York and San Francisco represented different eras, centuries apart! But that is the sort of puzzle regarding what went on in the New World in centuries before, and after, the time of Christ, which has delayed complete understanding of the amazing Mayan civilization which covered 175,000 square miles in the tropics.

The stone clew is apparently one of the date markers that Mayas set up. For some 1,500 years, these methodical Indians raised such stones every 20 years, and in their big cities even at five or ten year intervals. It is by deciphering these mileposts of time that archaeologists have trailed Mayan progress in Guatemala, Honduras, southern Mexico and Yucatan.

Discovery of the monument and ruins of a Mayan settlement so far west in Mexico is pronounced "exciting" by Dr. Spinden, who is awaiting final word as to whether the far west settlement proves early or late in Mayan history.

If it is early, as first reports indicate,

then it may point to the young and promising Mayan civilization as having gone east to seek its fortune before the Christian era, from a nondescript western origin among Indians of Mexico.

If, however, the monument and settlement turn out to be fairly late in Mayan history, after all—perhaps with early dates recorded there for some historic purpose that the Indians had in

mind—then it becomes clear that the Mayas had a base of their civilization down in the Vera Cruz region near the twelfth century. It would show that they played a direct hand in the affairs of Olmec and other Indian tribes of southern Mexico, then, even though their late center of power lay far to the northeast in Yucatan in great cities such as Chichen Itza, Uxmal, and Mayapan.

Science News Letter, February 25, 1939

ASTRONOMY

Planet Mars, Symbol of War, Has "Heart" of Iron

In Contrast, Mercury Has Comparatively Low Density; Spectrum Lines Show Many of Earth's Elements in Sun

THE OLD Romans probably never knew it, but when they picked ruddy Mars as the symbol of their god of war they chose one of the planets which has a "heart" of iron.

Best knowledge of astronomy now is that Mars, Venus and the earth have heavy central cores, or hearts, made of dense iron, said Dr. Rupert Wildt of Princeton University Observatory before the symposium on astrophysics sponsored by the American Philosophical Society and Franklin Institute.

In contrast, Mercury, like the moon, is a "rocky" planet, for its density is comparatively low.

The four giant planets—Jupiter, Saturn, Uranus and Neptune—are now thought to contain outer envelopes of some very light material. This light material, Dr. Wildt indicated, probably consists of hydrogen, lightest of elements, in a highly compressed state.

present in the sun in such small amounts that the instruments of science are not yet sensitive enough to detect them. Others give their spectrum lines in the violet colors and would be blocked out by the earth's layer of ozone.

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Solar Temperatures

ALMOST inconceivably high temperatures and pressures exist in the interior of stars, Dr. S. Chandrasekhar of Yerkes Observatory of the University of Chicago told the symposium. Using the method known as "integral theorems," it can be calculated that the pressure inside the sun, which is a typical star, amounts to 1,350,000,000 atmospheres. Likewise the temperature at the center of the sun is 7,400,000 degrees.

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PSYCHOLOGY

Society Called Powerful In Shaping Individuals

IF a society wishes, it can make its people acquisitive. It can incite them by the thousand or million to become warlike. It can evoke other traits, good or bad.

This tremendous power of environment, and particularly society, to shape human beings, is pointed out by Dr. Abraham Myerson, clinical professor of psychiatry, Harvard Medical School.

History has made experiments, he says, for our guidance. He reminds us that in the eighth, ninth, and tenth centuries

there were hordes of pirates and freebooters who sacked towns and cathedrals. As Norsemen they terrorized Europe. In time they became Scandinavians—today models for Europe in peaceful liberalism and progress.

The Scandinavian has not changed biologically. What happened was due to changes in his environment.

Dr. Myerson advocates a fresher view of the old argument over relative importance of heredity versus environment. They cannot be separated. And rather than speak of heredity, he prefers the term constitution. Environment is continually shaping, directing or damaging, providing use or disuse of qualities in body and mind. No good to be equipped with fingers and mind ready for a great musical career, and no musical instrument ever available. Geniuses, says Dr. Myerson, are made as well as born. In terms of nations, one environment evokes hereditary traits and actions, which other environments would suppress.

Tiny fruitflies in biological experiments strikingly demonstrate the power of environment to bring out hereditary factors. Kept in damp climate, generations of flies develop a peculiar kind of abdomen. In cold laboratories, legs are affected. Returned to normal, progenies of these flies in time are developing normally. In social chaos, or great poverty, the psychiatrist points out, human beings tend to be blighted like the abnormal little flies.

Science News Letter, February 25, 1939

PUBLIC HEALTH

Health Service Tells How To Control Syphilis

"THE cheapest thing any town can do with syphilis is to cure it."

This will probably become the slogan for the newest phase of the government's drive on venereal diseases. It is a statement made by Dr. R. A. Vonderlehr, U. S. Public Health Service, in announcing a new nine-point program for syphilis control in the local community. Details of the program appear in the federal health service publication, *Syphilis and Your Town*.

"People must learn to consult a doctor or clinic," Dr. Vonderlehr declared in telling how to control syphilis. "They must know that drugstore remedies and self-treatment are worthless. They must know that treatment begun early will cure syphilis in nearly every case, while, if left untreated, the patient is likely to develop brain, heart, or nervous system complications."

Science News Letter, February 25, 1939

Sun and Earth Alike

USING the tell-tale "fingerprints" of the elements, the characteristic spectrum lines, scientists have detected in the sun 64 of the chemical elements which are found on the earth, Dr. Charlotte M. Sitterly of Princeton University Observatory said. There is insufficient evidence for ascertaining the presence of nine more and there are 19 so-called "absent" elements.

The missing 19 elements may be absent only because man has yet been unable to find them, Dr. Sitterly declared. Some of the elements may be

RADIO

Radio That Rings a Bell To Call Forest Firemen

FOREST rangers on the lookout for fires may now call each other via a new radio bell-ringing device as easily as Mrs. Jones calls Mrs. Smith on the telephone.

Developed for use with a semi-portable short wave outfit, it makes it possible for a ranger to step away from the set itself to attend to other duties, and yet be within call. It can also be used to wake a ranger during the night, if trouble develops. A series of code signals are possible when several stations are included in any one Forest Service network.

Science News Letter, February 25, 1939

EXPLORATION

Lost Russian Lindbergh May Some Day Come Back

RUSSIA's Lindbergh, Sigmund Levan-
evsky, and five companions, last heard from Aug. 13, 1937, while on a flight from Moscow to the United States, may still be alive and may some day walk out of the Arctic to the astonishment of an unbelieving world.

If it happens, it will occur before 1943, for ice upon which they may still be drifting will reach open water and melt by then. The chances against such an escape are high—a hundred to one—but are not prohibitive, Vilhjalmur Stefansson, dean of Polar explorers, still believes.

It has happened before and can happen again, Mr. Stefansson declares in a new book, *Unsolved Mysteries of the Arctic*, (Macmillan). Even so, the Russian government was right in abandoning the search, he says.

Major Andrée and his last surviving companion on the ill-fated balloon expedition that set out to drift to the North Pole in 1897 probably died of carbon monoxide poisoning from their kerosene stove and not by freezing as more commonly believed, the Arctic veteran declares in his analysis of five major mysteries of the Far North.

The first colony of Europeans in the New World, Greenland, 9,000 strong at its height, disappeared through intermarriage with Eskimos and not through extermination by disease, hostile natives or lack of suitable European food, he states in raking up the question of what ever became of a democratic republic

that thrived for some 270 years five centuries ago.

The fate of Thomas Simpson, probable discoverer of the Northwest Passage to the Pacific, in the search for which dozens of expeditions set out in the very earliest days of New World exploration, is solved in the book in fashion reminiscent not only of the man who knows his northland but might serve as a Scotland Yard sleuth as well. The famous Englishman was murdered by vengeful half-breeds, Mr. Stefansson thinks.

Science News Letter, February 25, 1939

PUBLIC HEALTH

Smallpox Rears Its Ugly Head—But Why?

OUT in the Middle West, smallpox is rearing its ugly head and according to reports a number of citizens are alarmed. In Indianapolis, for example, 97 cases were reported in one week of January, and the city was averaging 40 cases a week during the first weeks of this year.

Other middlewestern communities have had a high smallpox incidence for a number of years. In the nation as a whole there were 11,673 cases with 30 deaths in 1937. In 1938 there were 14,015 cases according to incomplete reports so far available to the U. S. Public Health Service.

Fortunately, the cases are mild and perhaps that is why there is not more concern over the situation. The situation would not have to exist, however, because there is a sure way to avoid smallpox. That way is to be vaccinated against it.

An outbreak, even a small outbreak, of infantile paralysis or influenza or scarlet fever or most any other communicable disease arouses a great popular demand for protection. Physicians, medical researchers and health authorities are implored to find some way of "vaccinating" the population against the dreaded threat to health and life. Yet the very people who clamor for a "shot in the arm" of some potent, protective substance often refuse, for themselves and their children, the oldest and surest disease preventive of them all—smallpox vaccination.

The medical scientists who are trying hard to find more such preventives of disease must surely be discouraged, when they consider the smallpox vaccination situation. Here is something that is safe, simple and sure, just what they are asked to provide, and large numbers of people will have none of it.

Science News Letter, February 25, 1939

IN SCIENCE

GENERAL SCIENCE

Committee to Investigate Dismissal of Professor

THE AMERICAN Association of University Professors has appointed a committee to investigate the dismissal of Dr. Moyer Springer Fleisher, head of the bacteriology department of St. Louis University School of Medicine.

Dr. Fleisher was dismissed, the Rev. Harry B. Crimmins, president of the University, has declared, because of his sponsorship, along with several other persons, of a lecture on the Spanish war given by a former Catholic priest and because of his interest in the North American Medical Bureau to Aid Spanish Democracy.

Chairman of the investigating committee is Prof. Ernest W. Putpkammer, professor of law at the University of Chicago. The other members are: Prof. James P. Simonds, professor of pathology at Northwestern University Medical School, and Prof. Helen C. White of the University of Wisconsin. The committee is expected to have its report ready within about a month.

Science News Letter, February 25, 1939

ENGINEERING

Now Electric Ear Controls Grinding Mill

A NEW use for a microphone and electrical circuit, which makes the roar of a grinding mill regulate the flow of material into the mill, was described at the meeting of the American Institute of Mining and Metallurgical Engineers in New York City.

The device, known as an electric ear, makes the minerals feed into the crusher mill more rapidly if the mill is making too much noise. And if the mill is running too silently the device knows that it is feeding too rapidly and shuts down the intake of uncrushed materials. Just enough material is provided, at all times to give the highest efficiency.

The control of mill operations by the sound produced was described by Harlowe Hardinge of the Hardinge Company, York, Pa.

Science News Letter, February 25, 1939

SCIENCE FIELDS

GENERAL SCIENCE

Science World Interpreted For Knox College Students

THE WORLD as seen through the eyes of modern science is being interpreted for students of Knox College, Galesburg, Ill., by Watson Davis, director of Science Service, as guest lecturer on the William Lincoln Honnold Foundation, for three weeks beginning on February 20.

Among Honnold lecturers of past years at Knox have been Christopher Morley, Will Irwin, Louis Untermeyer and Ida M. Tarbell.

Science News Letter, February 25, 1939

CHEMISTRY

Nylon First Real Synthetic Fiber Made by Man

THE new chemical, nylon, which can be fashioned into silk-like fibers that make beautiful and amazingly tough stockings, is the first truly synthetic fiber which man has ever created.

But, you will ask, aren't rayon and this new wool-like fiber made out of cow's milk also synthetic fibers?

Chemists will answer, however, that of all the present-day fibers created by man and which do not occur naturally in nature, nylon is the only one which is strictly synthesized by science.

Rayon has as its basic material the cellulose of trees or of cotton. What the chemist does is to reconstitute the cellulose into a fiber material. The chemist is making a chemical fiber when he makes rayon.

Similarly the new lanital "wool" of Italy, made out of the casein of milk, is really a chemical rearrangement of the protein occurring in the casein.

Glass, metal and asbestos fibers can be called physical fibers because they contain some original mineral material whose shape and, in some cases even appearance, have been altered by physical means.

In the creation of nylon chemistry has started out with coal, air and water and built up, by an intricate process, a material that can be spun into fibers finer than silk, stronger and more elastic than silk.

Hose of nylon will not be on the market for a year to come but already a few

experimental pairs have passed astounding tests. In one case a girl wore a pair of these hose for 20 days with sandles and walked in beach sand. At the end of that time the stockings showed no appreciable wear to this harsh abrasive action. Try that with any other hosiery fiber—natural and artificial—and see how quickly the gritty sand cuts through the fiber.

Science News Letter, February 25, 1939

ARCHAEOLOGY

Study Half-Way Point In Ancient American Axis

THE heaviest loot that Spanish conquerors took from Indians in the New World did not come from any city or hoard within the Incan Empire. It came from Indian cemeteries farther north, in Colombia near Panama.

Describing a recent archaeological survey of this once-flourishing Indian region, Dr. Herbert J. Spinden of the Brooklyn Museum says that this was the first part of the South American continent to feel the impact of European contact. Three little kingdoms—or queen-dom, as he thinks they might better be called—occupied the lands near the Sinu river. Since two of the governments had queens, and since women were delightfully and smilingly portrayed on pottery art objects, he suspects the culture of Sinu may have been luxurious and ultra-feminine.

At any rate, by 1530 Spanish armies had dug up most of the cemeteries for the golden articles in them, and had left for archaeologists a badly wrecked "buried history" of the region.

Yet Colombia cannot be given up as an archaeological puzzle, because of its importance in America's past. Dr. Spinden points out that it was the half-way point between the high civilizations of Indians in Mexico and Peru. Along a north-south axis, by way of mountain roads, flowed an interchange of Indian ideas.

Archaeologists, who used to despair of ever finding out what connection, if any, there was between Mexican Indians and Incas, now have visible evidence from various researches. Dr. Spinden cites definite examples showing that important art and metallurgical techniques passed from central Mexico to central Peru. And along the same mountain route, he adds, flowed such cultural ideas as the Sky God as a jaguar, the sun as a disk containing the face of this jaguar god with serpent rays, the humanization of eagles.

Science News Letter, February 25, 1939

GENERAL SCIENCE

Interest in Science Distinguished Late Pope

THE LATE Pope Pius XI was recognized by the world of science as a friend and his passing is sincerely regretted by scientists of all creeds and opinions. He showed his interest in science in three major ways:

His recent protests against suppression of freedom in dictator countries, some of them written while he was in seriously bad health, included a defense of scientific freedom along with his championship of religious and social liberty.

One of the first acts of his reign was a thorough modernization of the Vatican Library, which made available many old manuscripts and books of great importance in the history of science.

In 1936 he re-established the Pontifical Academy of Sciences, including in the first list of new members the names of six American leaders in research: Prof. George D. Birkhoff of Harvard University, Dr. Alexis Carrel of the Rockefeller Institute, Profs. Robert A. Millikan and Thomas H. Morgan of the California Institute of Technology, Prof. Hugh S. Taylor of Princeton University, and Prof. George S. Sperti of the Institutum Divi Thomae in Cincinnati.

Pius XI was the first pope to ride in an automobile in the Vatican gardens, and the first to broadcast his voice over the radio. He was a close friend of the late Senator Marconi, wireless pioneer, and the Vatican radio station was installed under Marconi's direction.

Science News Letter, February 25, 1939

GENETICS

Quadruplets Fairly Common But All Rarely Survive

THE BIRTH of quadruplets may be an exciting event to the family concerned, but medical statistics show that they are relatively common. They occur once in every 512,000 births. It is extremely rare, however, for all four to survive to adulthood. The Keys quadruplets of Oklahoma, all girls, are notable exceptions.

Even commoner are triplets and twins, the former occurring about once in 6,400 births and the latter once in 80 births. An easily remembered mathematical ratio for the occurrence of these multiple births is the following: twins, 1:80¹; triplets, 1:80²; quadruplets, 1:80³.

Science News Letter, February 25, 1939

ASTRONOMY

Watch for Mercury

**Rarely Seen Planet Is in the Evening Skies in March;
Argo, Largest of Constellations, Is Also Visible**

By JAMES STOKLEY

ALTHOUGH no planets are sufficiently well placed during March to be on the accompanying maps (which show the skies at 10:00 p. m., March 1; 9:00 p. m., March 15, and 8:00 p. m., March 30) tiny Mercury will come into view for a brief period about the 16th. Then it will be visible low in the west just after sunset. About an hour and a half after the sun has vanished it, too, will drop behind the horizon, and that while twilight is still visible. However, Mercury is quite brilliant, and it should be easy to pick it up. On the evenings, especially, of March 15, 16 and 17, look just above the horizon, directly west, for a shining point of light. This will be Mercury, for there is nothing else there that might be confused with it.

Saturn, the ringed planet, is still in the evening sky, but by the end of the month it will approach too nearly into line with the sun to be seen easily. It is much fainter than Mercury. As soon as the sky is dark, this planet will appear low in the west, in the constellation of Pisces, the fishes. As for the other planets, Mars comes into view about 1:00 a. m., low in the southeast, in Sagittarius, the archer; Venus about two hours before sunrise, shining so vividly that it is easy to locate; while Jupiter is now almost in the sun's direction, and cannot be seen at the present time.

Orion Still Shines

Among the stars, Orion, and the beautiful winter time constellations surrounding it, are still with us in the evening, to the southwest. The three stars in a row, forming Orion's belt, are easy to locate. Above is Betelgeuse, below is Rigel. Follow the direction of the belt stars to the left, and you come to Sirius, the dog star, most brilliant of these distant suns seen at night. To the other side of the belt is red Aldebaran, the eye, of Taurus, the bull.

A little west of the zenith are Gemini, the twins, with Castor and Pollux. Between the twins and the great dog, in which Sirius shines, is the little dog, Canis Minor, with Procyon. Above Taurus is Auriga, the charioteer, of which

Capella is the brightest star. The great dipper, in Ursa Major, the great bear, is to the northeast, upside down, the bowl to the left. The position of the pointers is shown on the map. These show the direction, below, of the pole star. In the other direction, to the south, they lead to the Sickle, in Leo, the lion, of which first magnitude Regulus forms the end of the handle. If you follow southward the curve of the dipper's handle, you come first to Arcturus, in Bootes, the bear driver, then to Spica, in Virgo, the virgin.

Directly south, far less conspicuous than the groups already mentioned, is part of the greatest of all, Argo, the ship. Unfortunately, however, the most brilliant parts do not rise except in the extreme southernmost parts of the United States. So large is Argo that it is subdivided into four constellations, Carina, the keel, Vela, the sails; Pyxis, the compass, and Puppis, the stern. None of Carina is shown, but most of Puppis is visible, to the left of Canis Major. All of Pyxis can be seen, but this is inconspicuous. Below is a little of Vela.

Spring Coming

Most welcome event during the coming month after a winter which brought severe blizzards to many parts of the country, happens March 21, at 7:29 a. m., E. S. T. Then, the sun, in the middle of its northward journey through the sky, crosses the equator, an event called the Vernal Equinox, marking the official beginning of spring. On that date the sun rises directly east and sets directly

west, so day and night are approximately equal in length.

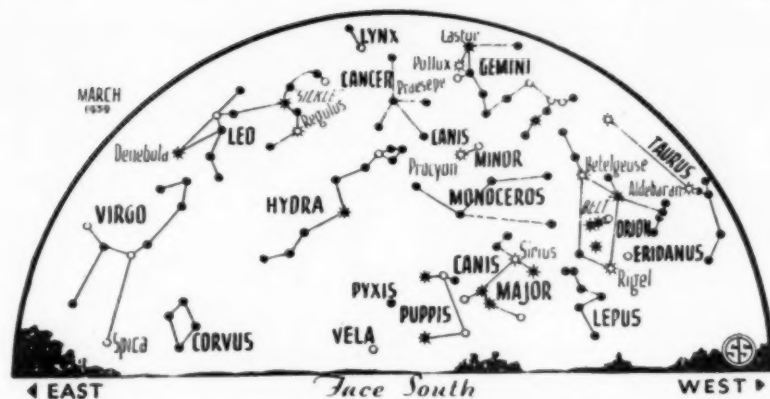
Another interesting phenomenon, however, comes in the morning hours of March 8, when the bright star Spica is occulted, or "eclipsed" by the moon. This will not be visible at all in New England. In the eastern part of the country it does not happen until the dawn is well under way, and, with the naked eye, it will be difficult to see the star. But in the Middle West and West, it will occur earlier. In Illinois, for instance, the moon, in the gibbous phase, a few days past full, will cover the star at 3:26 a. m., C. S. T., and will uncover it at 4:13 a. m., C. S. T. In California, the star will disappear at 12:20 a. m., P. S. T., and will emerge at 1:39 a. m., P. S. T.

Binoculars Help

A pair of binoculars, or even opera glasses, will help the view. The star will be covered by the bright edge of the moon, but will reappear from behind the darkened part. When it does so, it pops into view very suddenly, for there is no air around the moon partially dimming the star's light, even after it is clear of the solid part. Observations of occultations, such as this, are a very good means of checking the accuracy of predictions of the moon's motion.

Perhaps a few words might be said as to why March affords almost the only time this year that one can see Mercury. This planet, on the average, is only 25,950,000 miles from the sun, compared with 92,900,000 miles from the earth, so that it revolves in the smallest of the planetary orbits. It makes a trip around the sun every 88 days, but, in this period, the earth makes almost a quarter trip





◊ * ◦ • SYMBOLS FOR STARS IN ORDER OF BRIGHTNESS

around. Thus, it takes about 116 days for Mercury to catch up to the earth. As it does so, of course, it is almost between earth and sun and is not visible. About 63 days later it is again in line with the sun, but beyond it, also invisible.

After it has been between the earth and sun, the planet moves to the west, and when farthest in that direction, before it has started to go behind, it is said to be in "greatest western elongation." Then it is a morning star, rising before the sun. But after it has been behind, it is to the east of the sun, following that body in its daily motion across the sky, visible after sunset as an "evening star." This happens on March 16—then Mercury is at "greatest eastern elongation." Only at times of such elongations, either east or west, is the planet far enough removed from the sun's glare to be apparent.

To be seen in the evening sky, a springtime eastern elongation is best, for then the "ecliptic," the line along which the planets move, is nearly at right angles to the western horizon. Even though Mercury will be to the east of the sun again on July 13 and November 7, these will not be as favorable. Then the planet will be even farther away from the sun's direction than now, but, instead of being above the sun, it will be much more nearly to the side. Thus, Mercury will be much lower at sunset, and will set a much shorter time after the sun, while the sky is still very bright.

Celestial Time Table for March, 1939

Friday, March 3, 5:47 p. m., Algol at minimum. Saturday, March 4, 6:00 a. m., moon nearest earth, 223,000 miles. Sunday, March 5, 1:00 p. m., full moon. Wednesday, March 8, early morning, occultation of Spica. Sunday, March 12, 4:37 p. m. moon at last quarter. Monday, March 13, 12:16 a. m., moon passes Mars. Thursday, March 16, 10:00 a. m., moon farthest, 252,100 miles; 8:00 p. m., Mercury farthest east of sun—

visible as "evening star" about this date. Friday, March 17, 4:29 a. m., moon passes Venus. Saturday, March 18, 1:53 a. m. Algol at minimum. Monday, March 20, 8:49 p. m., new moon; 10:42 p. m., Algol at minimum. Tuesday, March 21, 7:29 a. m., sun crosses equator—spring commences. Wednesday, March 22, 12:17 p. m., moon passes Saturn. Thursday, March 23, 7:31 p. m., Algol at minimum. Sunday, March 26, 4:21 p. m., Algol at minimum. Tuesday, March 28, 7:16 a. m., moon at first quarter.

All times are in E. S. T.

Science News Letter, February 25, 1939

NEW PUBLICATION

February 15, 1939

Life Processes in Gray Norway Rats During 14 Years in Captivity

HELEN DEAN KING

The Wistar Institute of Anatomy and Biology

The American Anatomical Memoirs, No. 17

Various changes in life processes of captive gray Norway rats are reported. The data analyzed comprise 8685 litters, containing 53,077 individuals born in the first twenty-five generations.

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STATISTICS

Death Certificates Could Give Better Birth Data

DEATH certificates of married women, if changed in one small particular, to show number of children they have had, could give better birth statistics than are now obtainable, suggests Prof. Raymond Pearl of the Johns Hopkins University. (*Human Biology*, February)

Prof. Pearl points out that the present dependence on birth registration for statistics on fertility in women fail in two important respects. They give no information at all about women who never have children, and they do not tell, in the case of any given birth certificate, if that is the last child the mother is ever going to bear.

However, if a space could be left on the death-certificate blank for a complete listing of all children borne by a woman thus brought to the end of all possible motherhood, the records could, after a few years, be made much more definite.

Science News Letter, February 25, 1939

In Press

A DETAILED AND COMPREHENSIVE INDEX To the ADVANCE

ABSTRACT CARD SERVICE

For Cards Nos. 6877 to 7397 inc., issued January 1 to December 31, 1938 Presented to the 1938 Subscribers

The Wistar Institute of Anatomy and Biology is distributing shortly, to the 1938 subscribers to the Advance Abstract Card Service, an Index which should enormously increase its usefulness.

Each 1938 abstract has been indexed in four different ways:

1. According to author
2. According to a comprehensive and detailed subject classification
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Non-subscribers to the Advance Abstract Card Service may purchase this Index separately.

PHYSIOLOGY

Life Begins On Spring-Like Coils

LIFE begins with spiral springs, it appears from researches of Dr. W. D. Francis of the Botanic Gardens of Brisbane, Australia. (*Science*, Feb. 10).

Dr. Francis has made minute examinations of the protoplasm of various kinds of cells, ranging from bacteria to onion cells, and states that a spiral structure is characteristic of all. He also cites support for his thesis found in the published work of other investigators.

This spiral, spring-like structure of protoplasm, he declares, explains the great elasticity of this living substance.

Science News Letter, February 25, 1939

RADIO

Radio Tube for Altimeter Generates a 14-Cm. Wave

A PRACTICAL radio tube generating an ultra short-wave but five and a half inches long—short enough for the radio echo altimeter now under development to show pilots how high they are above the ground and to warn them of other planes nearby—is announced by two engineers of the General Electric Company, W. C. Hahn and G. F. Metcalf.

Its waves, a fourth as long as the waves now used in experimental echo altimeters, can be directed like the beam of a searchlight, the two engineers said. Waves as short as a single centimeter—about two-fifths of an inch—can be generated by a tube working on the same principle. The shortest wave received on a home radio set is about five meters, or more than 15 feet.

The tubes can also be used for guiding ships through dense fogs by enabling them to measure the distance to land or other vessels.

Science News Letter, February 25, 1939

PATON RANCH

Situated on a mountain stream in the foothills of the Big Horn Mountains. Here a limited number of guests are cordially welcomed.

It is a region of great geological and historical interest. Marine fossils, dinosaur bones and Indian implements are found nearby.

Guest cabins are comfortable and attractive. Food is good. The use of a saddle horse is included in the weekly rate.

Write for illustrated folder with map.

WILLIAM PATON

Shell

Wyoming



LIKE A SPINET

Laurens Hammond, inventor of this new electric musical instrument, watches as his player demonstrates how it is operated.

ENGINEERING—MUSIC

Electric Musical Instrument Imitates Orchestra Pieces

In Appearance Like an Old-Fashioned Spinet, Novachord Will Make Possible Entirely New Types of Compositions

NEW types of musical compositions, employing tones never heard before as well as the tones of more than one instrument for a single player, are now possible through development of a highly versatile electrical instrument—the Novachord.

Looking for all the world like an old-fashioned spinet, it made its bow in Washington, D. C., by pouring forth the varied notes of a piano, violin, Hawaiian guitar, harpsichord, clavichord, trumpet and French horn.

The Novachord uses vacuum tubes instead of piano or violin strings or the pipes of a wind instrument. It was invented by Laurens Hammond, inventor of the Hammond electric organ, which likewise uses electric currents to produce its music instead of the familiar banks of pipes.

Requiring only to be plugged into a

household light outlet, the Novachord is smaller than a grand piano. It contains no pipes, reeds, strings, hammers or vibrating parts. It has a keyboard of 72 notes which are, however, played exactly like a piano and has the regulation piano sustaining pedal and a pedal for controlling volume.

Punching the keyboard and using the other controls determines the type of electric wave generated in the vacuum tubes. This electric wave is then converted into sound in much the same method as a radio.

Its imitating abilities it owes to the fact that the person playing it can change at will the two chief varying characteristics which give each musical instrument its identity, it was explained. A group of controls mounted on the front panel above the keyboard makes this possible.

An instrument's distinctive sound is

determined by tone color—the basic tone plus the harmonics of that tone—and the “envelope”—the speed with which a note is built up and dies away. Percussion instruments such as the piano give a tone which starts almost at its height and dies away gradually. String tones are built up and die gradually.

One group on the left controls the actual tone color, while the other varies the “envelope.” The player can thus pick the tone color and “envelope” he desires.

Mr. Hammond does not consider the Novachord strictly an imitative instrument. It does, however, bring up distinct new possibilities for varied orchestral effects and for greater diversification of home entertainment.

Science News Letter, February 25, 1939

PHYSICS

Tests Show 200-Year-Old Paper To Be Good as New

PAPER more than 200 years old has been found by National Bureau of Standards tests to be almost as good as when made. A page from a book printed in 1722 was subjected to the standard accelerated aging test, heating for 72 hours at the temperature of boiling water. The rag fibers of the paper were found practically in perfect condition; the loss of folding endurance after test was only three per cent.

Science News Letter, February 25, 1939



INSIDE

Under the case, the resemblance to a spinet ends. Mr. Hammond (right) explains to an interested group the workings of the vacuum tube “strings” in his Novachord.

PSYCHIATRY

Adolescent Crime Has Its Beginnings in Babyhood

A MASKED bandit enters the lonely filling station and points a gun at the proprietor. Quick action results in the capture and unmasking of the culprit. One expects to see revealed a man hardened in crime. But, no, most likely, it is a youngster in his teens, and off he goes on the first leg of that long journey that leads so many to reform school, jail, and prison.

Why are so many criminals young adolescents? Does adolescence itself produce crime? These questions were put to Dr. Ben Karpman, of St. Elizabeth's mental hospital, experienced with criminals and the mentally abnormal.

His reply is characteristic of the physician.

“Diseases are preceded by an incubation period,” he said in the journal *Mental Hygiene*. “You may find that the measles rash on a child appeared on a certain day, but the disease was no doubt contracted perhaps several weeks before. In mental diseases the incubation period is much longer.

“I submit, therefore, that it is not possible to speak of adolescence as a stage in which crime finds its first expression, but rather that we have to go to the earliest stages of the child's development in order to uncover the true period in which the anti-social behavior began.”

Responsibility for a child's development of criminal behavior is placed squarely upon the family by Dr. Karpman. A broken home is particularly culpable—not just a home deprived of one of the parents, but a home which the child feels for some reason does not belong to him. Affection is essential.

“The making of a good citizen can be traced directly to his early years, and

to his reaction to the affection given by the various members of the family . . .

“The responsibility of the family is grave. It cannot be denied that criminals develop through failure on the part of the family to provide binding emotions, necessary to keep the child within the family.”

Science News Letter, February 25, 1939

PHARMACY

Profession of Pharmacy In Need of Recruits

IN THESE days of overcrowded ranks in many professions, it is both interesting and gratifying to learn that one of the oldest, pharmacy, is sending out a call for recruits—not to swell the ranks of clerks in department drug stores, but to join with physicians in healing the sick.

A shortage in the supply of “properly qualified pharmacists available for active service in professional practice” exists in New Jersey, Delaware and Pennsylvania, the Philadelphia College of Pharmacy and Science reports.

Part of this shortage is due to more stringent requirements for entrance to pharmacy colleges, more rigid regulations of pharmacists by state boards and the lengthening of the professional course in pharmacy to four college years. Another factor is the general economic improvement which has caused a return of pharmaceutical retail practice to predepression levels and which has increased the demand for trained pharmacists in other fields.

On the economic side, a career in pharmacy looks bright. It will be at least four years, it is estimated, before enough new pharmacists have been

See Page 127-128 For Book Reviews

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Filling prescriptions or performing other duties in retail pharmacies is by no means the only occupation open to pharmacy graduates. About one-third of the graduates of schools of pharmacy become retail store owners, a survey showed. Nearly another third are employed in such stores. The remaining third are listed as industrial owners, executives, teachers, research workers, physicians and other professional men, technical organization and journal executives, manufacturers' representatives or as having engaged in a host of other related occupations.

ORDNANCE

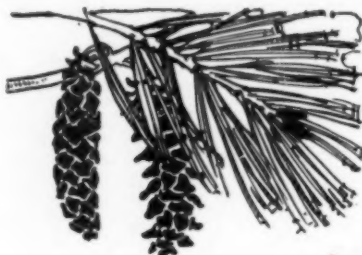
An anti-aircraft shell need not actually strike its target to destroy it. The concussion of the explosion, together with the flying cloud of steel splinters, will ordinarily suffice to destroy the plane. Present anti-aircraft shells are detonated by a clockwork fuse, which has to be set mechanically before firing.

FORESTRY

NATURE

RAMBLINGS

by Frank Thone



Science News Letter, February 25, 1939

MEDICINE

Science News Letter, February 25, 1939

Sacred lakes near Egypt's great temples were artificial pools providing water for ritual purposes and also a place to float model boats used in religious processions.

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● RADIO ●

Dr. George D. Stoddard, director of the Iowa Child Welfare Research Station, Iowa City, will be guest scientist on "Adventures in Science" with Watson Davis, Director, Science Service, over the coast to coast network of the Columbia Broadcasting System, Thursday, March 2, 7:15 p. m. EST, 6:15 p. m. CST, 5:15 p. m. MST, 4:15 p. m. PST. Listen in to your local station. Listen in each Thursday.

•First Glances at New Books

Additional Reviews
On Page 128

Conservation

TROUT STREAMS: CONDITIONS THAT DETERMINE THEIR PRODUCTIVITY AND SUGGESTIONS FOR STREAM AND LAKE MANAGEMENT—Paul R. Needham—*Comstock*, 233 p., \$3. Everyone interested in trout, from conservationist and hatchery superintendent to fisherman and cook, will prize this study of the world the trout lives in. It tells, in brief but adequate and accurate fashion, of the fish themselves, the physical and chemical states of trout waters, the natural history of the insects and other aquatic animal forms that are trout food: a unique and practical book.

Science News Letter, February 25, 1939

Education

THIRD DIGEST OF INVESTIGATIONS IN THE TEACHING OF SCIENCE—Francis D. Curtis—*Blakiston*, 419 p., \$3.50. Results of 93 research projects on a wide variety of questions in educational methods, compactly abstracted for busy teachers and school administrators.

Science News Letter, February 25, 1939

History of Science

A HISTORY OF SCIENCE, TECHNOLOGY AND PHILOSOPHY IN THE EIGHTEENTH CENTURY—A. Wolf—*Macmillan*, 814 p., 345 illus., \$8. A monumental work of permanent importance by the University of London historian of science. A companion to his earlier work on the 16th and 17th centuries, it will be of great usefulness as a tool in the spreading study of the history of science.

Science News Letter, February 25, 1939

General Science

SCIENCE PROBLEMS FOR THE JUNIOR HIGH SCHOOL. BOOK 2—Wilbur L. Beauchamp, John C. Mayfield, Joe Young West—*Scott, Foresman*, 578 p., \$1.48. With the verve of a well-illustrated science magazine, this text should attract the students exposed to it.

Science News Letter, February 25, 1939

Population

PROCEEDINGS, INTERNATIONAL POPULATION CONGRESS, PARIS, 1937: Vol. 1, Théorie Générale de la Population, 270 p., \$1.35; Vol. 2, *Démographie Historique*, 106 p., 70 c.; Vol. 3, *Démographie Statistique: Études d'ensemble*, 156 p., 80 c.; Vol. 4, *Démographie Statistique: Études Spéciales (État de la Population, Migrations)*, 147 p., 80 c.; Vol. 5, *Démographie Statistique: Études Spéciales (Natalité, Nuptialité, Mortalité)*, 245 p., \$1.20; Vol. 6, *Démogra-*

phie de la France d'Outremer, 128 p., 80 c.; Vol. 7, *Facteurs et Conséquences de l'Évolution Démographique*, 212 p., \$1.10; Vol. 8, *Problèmes Qualitatifs de la Population*, 258 p., \$1.35; Complete set, \$8.—*Hermann et Cie, Paris*, American agent, *Population Assn. of America*.

Science News Letter, February 25, 1939

Bibliography

BY WAY OF INTRODUCTION—A Book List for Young People—Joint Committee of the A. L. A. and the National Educ. Assn.—*Amer. Library Assn.*, 130 p., 65 c.; 10 br more, 35 c.

Science News Letter, February 25, 1939

Photography

HOW TO TONE PRINTS—Arthur Hammond—*American Photographic Publishing Co.*, 72 p., 50 c. A small handbook of formulas and instructions for the dark-room enthusiast who wants to make an excursion into the field of color without the use of color photography or hand tinting.

Science News Letter, February 25, 1939

Ornithology

BIRDS FROM SIAM AND THE MALAY PENINSULA IN THE UNITED STATES NATIONAL MUSEUM COLLECTED BY DR. HUGH M. SMITH AND WILLIAM L. ABOTT—J. H. Riley—*Govt. Print. Off.*, 581 p., 75 c. Full descriptions and notes on one of the most notable collections of birds brought to the U. S. National Museum for many years.

Science News Letter, February 25, 1939

Geography—Ethnology

VENEZUELA—Erna Fergusson—*Knopf*, 346 p., \$3. A discerning traveler, Miss Fergusson introduces her readers to a country with rare completeness and charm. She is interested more in the people and their character and problems than in the land. "Venezuelans," she tells us, "are a people to wonder about, perhaps to fear for, but a people to command admiration."

Science News Letter, February 25, 1939

Mathematics

THE GEOMETRY OF DETERMINANTAL LOCI—T. G. Room—*Cambridge (Macmillan)*, 483 p., \$10. A new book on projective geometry which will be welcomed by students of mathematics everywhere. It is distinctly a book for graduate school use and for teachers of college mathematics.

Science News Letter, February 25, 1939

Journalism

MAGAZINE WRITING AND EDITING—Mitchell V. Charnley and Blair Converse—*Cordon*, 352 p., \$3.25. A comprehensive, beautifully printed book that should be of great aid to those who wish to do a professional job of attempting to write for the periodical press.

Science News Letter, February 25, 1939

Conservation

AMERICA BEGINS AGAIN—Katherine Glover—*Whittlesey House*, 382 p., illus., \$2.75. A book about the New Conservation, which brings out the drama and the crusading spirit in present-day efforts in soil conservation, flood control, wildlife restoration and regional planning; it puts emotional punch behind the recitation of facts.

Science News Letter, February 25, 1939

Political Science

NEXT STEPS FORWARD—Donald Slesinger—*National Home Library*, 219 p., 25 c. Interpretations by the Twentieth Century Foundation of studies on taxation, big business, government debt and old-age security.

Science News Letter, February 25, 1939

Botany

ANDERSON'S HERBARIUM (Camp Special)—E. S. Anderson—*E. S. Anderson*, 38 p., 25 c. A booklet for beginning collectors, in which text is interspersed with blank pages for the mounting of small specimens. Cellophane sheets to cover them are supplied in a separate envelope.

Science News Letter, February 25, 1939

Education

THE MUSEUM AND POPULAR CULTURE—T. R. Adam—*Amer. Assn. for Adult Education*, 177 p., \$1. Three chapters of this study are of direct science interest: "The Revival of Nature Lore," "Methods of Nature Study," "Science, Industry and Commerce." The book as a whole is inspirational as well as factual.

Science News Letter, February 25, 1939

Botany

POISONOUS PLANTS OF THE UNITED STATES—Walter Conrad Muenscher—*Macmillan*, 266 p., \$3.50. The author of "Weeds" scores again, with a well-arranged, cleanly illustrated description of the principal poisonous plants of this country. It is primarily a reference work for botanists, toxicologists, veterinarians, and other professional workers.

Science News Letter, February 25, 1939

•First Glances at New Books

Additional Reviews
On Page 127

General Science

BACKGROUND TO MODERN SCIENCE—Joseph Needham and Walter Pagel, editors—*Macmillan*, 243 p., \$2. Ten lectures at Cambridge University, England, arranged by its History of Science Committee, covering the modern period of science, the last 40 years. This is the beginning of a welcome movement toward understanding science in its historical significance. The lectures given in 1936 are by such authorities as Cornford, Dampier, Rutherford, Bragg, Aston, Eddington, Ryle, Nuttall, Punnett, and Haldane.

Science News Letter, February 25, 1939

Medicine

PRACTICAL BIRTH-CONTROL METHODS—Norman E. Himes, with the medical collaboration of Abraham Stone—*Modern Age Books*, 254 p., 95 c. A thorough, frank, detailed and authoritative discussion of all aspects of contraception.

Science News Letter, February 25, 1939

Photography

MODERN PORTRAITURE—Stanley R. Jordan—*Camera Craft*, 199 p., \$3. Here is a book which introduces, it is said, the techniques of the Hollywood studios to the production of superior portraits. The details of proper lighting, of make-up for the camera, and tricks on proper poses are all of interest to the professional and amateur photographer.

Science News Letter, February 25, 1939

Education

A STUDY OF THE POSSIBILITIES OF GRAPHS AS A MEANS OF INSTRUCTION IN THE FIRST FOUR GRADES OF THE ELEMENTARY SCHOOL—Ruth G. Strickland—*Teachers College, Columbia Univ.*, 172 p., \$1.85. Pictures are an easy natural language and since graphs and "little man" charts are being used extensively and successfully in other places, why not in the schools?

Science News Letter, February 25, 1939

Child Study

STUDIES IN CHILD GUIDANCE—Jean Walker MacFarlane—*Society for Research in Child Development, National Research Council*, 254 p., illus. \$2.

Science News Letter, February 25, 1939

Physics

FUNDAMENTAL PRINCIPLES OF PHYSICS—Herman G. Heil and Willard H. Bennett—*Prentice-Hall*, 631 p., \$5. College physics text for engineering schools where it is assumed that calculus and physics are taught simultaneously. The emphasis

of the book is on the classical time-tried physics and to a very little extent on the modern atomic physics. In this, the volume differs from many of the newer college texts, but probably fulfills its role of giving basic engineering training.

Science News Letter, February 25, 1939

Photography

SNOW AND ICE PHOTOGRAPHY—H. W. Wagner—*Camera Craft*, 96 p., \$1. The scenes of winter present some of the greatest beauties that photography can capture. But unfortunately the glaring whiteness of snow and ice requires considerable experience and knowing a few tricks of the trade. In this little volume this knowledge is presented clearly and understandably.

Science News Letter, February 25, 1939

History

MEDIEVAL PANORAMA: THE ENGLISH SCENE FROM CONQUEST TO REFORMATION—G. G. Coulton—*Cambridge (Macmillan)*, 801 p., \$4. Dr. Coulton aptly likens the medieval scene to "foreign travel" for it is a strange people, with curious customs, who are described and discussed in these pages. The reader can see here an earlier age than ours which struggled with growing pains and when "theory outran practice." It is a vivid book and an enlightening one.

Science News Letter, February 25, 1939

Medicine

NUTRITION: THE NEWER DIAGNOSTIC METHODS. Proceedings of the Round Table on Nutrition and Public Health—*Milbank Memorial Fund*, 192 p., \$1. Technical discussions of interest chiefly to physicians and nutritionists.

Science News Letter, February 25, 1939

Biology

WILD COUNTRY: A HIGHLAND NATURALIST'S NOTES AND PICTURES—F. Fraser Darling—*Cambridge (Macmillan)*, 103 p., \$2.75. A well-known British naturalist talks and shows pictures, about birds and mammals and plants on the cliffs of Scotland and the Isles and in the less strenuous glades of England.

Science News Letter, February 25, 1939

Entomology

BEES IN THE GARDEN AND HONEY IN THE LARDER—Mary Louise Coleman—*Doubleday, Doran*, 131 p., \$1.75. In the course of relating her own experience with bees the author manages to impart a lot of information about bees and beekeeping. If you have a sweet tooth this book will make your mouth water.

Science News Letter, February 25, 1939

Horticulture

THE GARDENER'S TRAVEL BOOK—Edward I. Farrington, ed.—*Hale, Cushman and Flint*, 390 p., numerous plates, \$2.50. If you are garden-minded and have a car, this book is likely to make a gypsy of you. Listing the states alphabetically, it sets down opposite the names of towns notable things in the way of trees, rose gardens, flower festivals, all manner of horticultural treats that you may see all over the United States and Canada. There are half-page sketch maps, too, with annotations.

Science News Letter, February 25, 1939

Meteorology

WEATHER—Gayle Pickwell—*McGraw-Hill*, 170 p., illus., \$3. Re-publication, by a new firm, of a beautifully illustrated popular work, first reviewed in SNL for November 20, 1937. It is now planned to make this the first of a series of four, the forthcoming volumes to be on Deserts, Birds, and Animals, respectively.

Science News Letter, February 25, 1939

Biology

LIFE'S BEGINNING ON THE EARTH—R. Beutner—*Williams & Wilkins*, 222 p., \$3. A new attack on the old and ever-baffling problem of how life originated, in which advantage is taken of some of the newer discoveries of biophysics and biochemistry, particularly of viruses and enzymes.

Science News Letter, February 25, 1939

Sociology

THE CHANGING COMMUNITY—Carle C. Zimmerman—*Harper*, 661 p., \$3.50. Village, town and city are viewed as organisms which may have various kinds of behavior. You'll recognize the communities you know in Littleville, Lonely, Utopia, Indecisive, Stability, Nudeal, Hillville, Babbit, Mayflower, Milkville, etc.

Science News Letter, February 25, 1939

Exploration

UNSOLVED MYSTERIES OF THE ARCTIC—Vilhjalmur Stefansson—*Macmillan*, 381 p., \$3.50. See page 120.

Science News Letter, February 25, 1939

Botany

FLORA OF COSTA RICA. Part IV.—Paul C. Standley—*Field Museum of Natural History*, 434 p., \$2.50. The concluding volume of this work, comprising families *Gesneriaceae* to *Compositae*, with an appendix of additions and corrections.

Science News Letter, February 25, 1939